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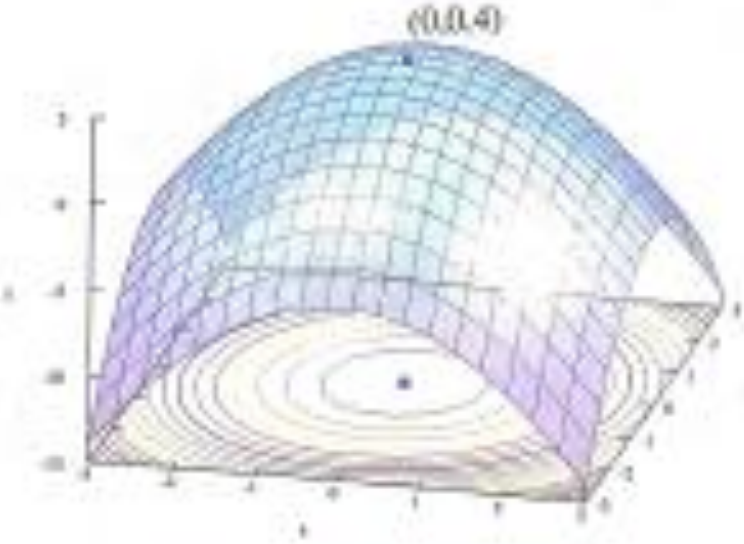

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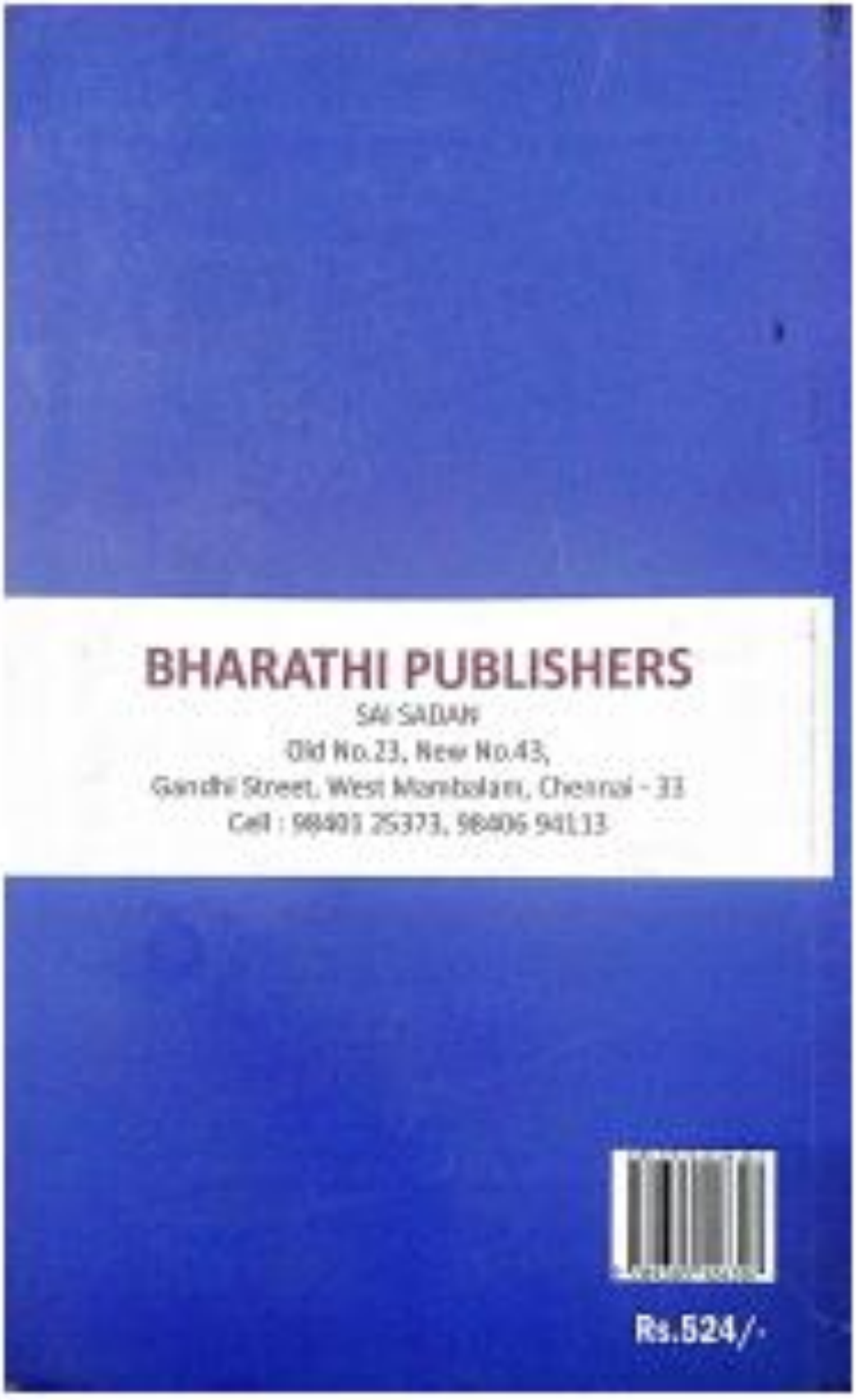
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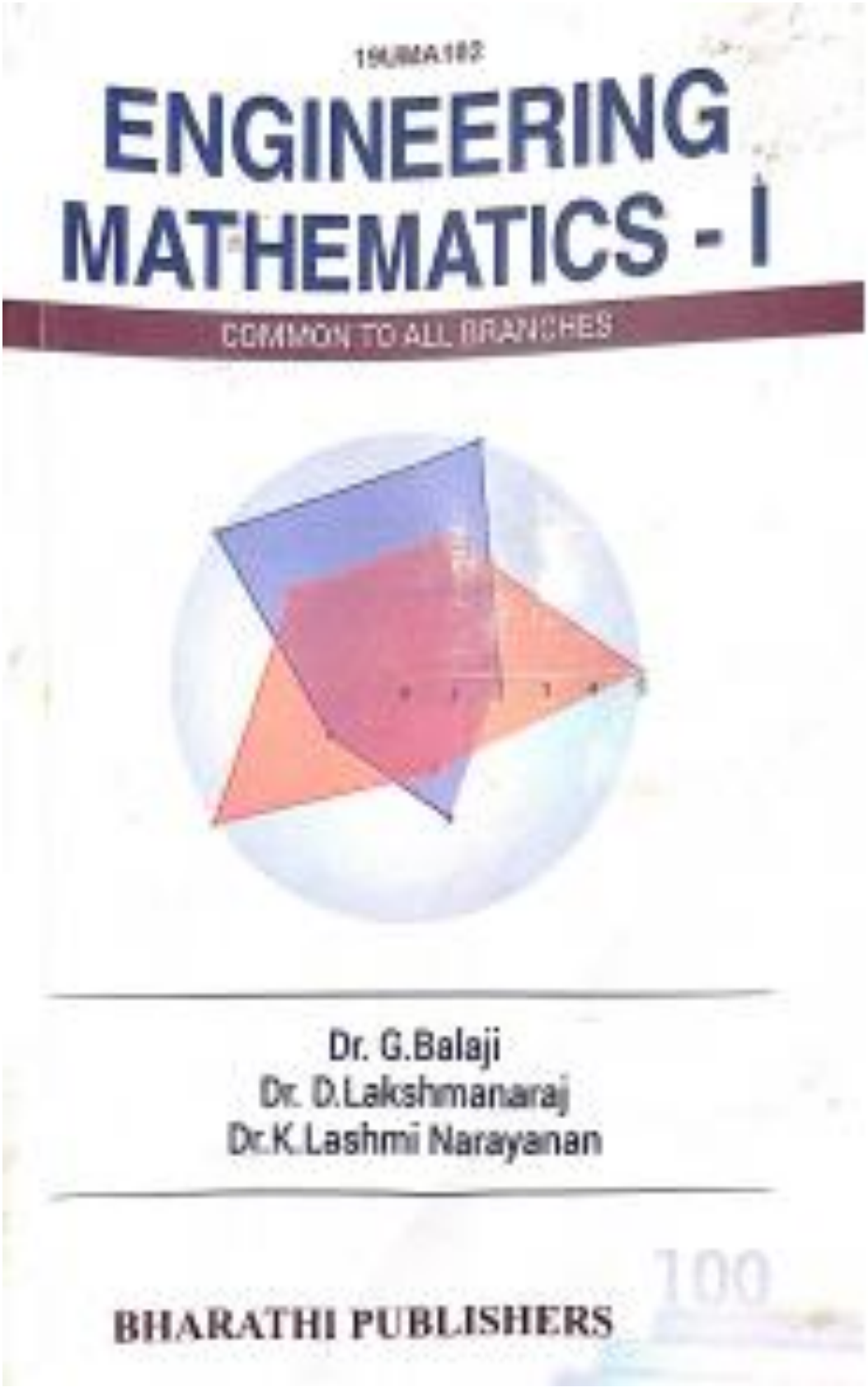
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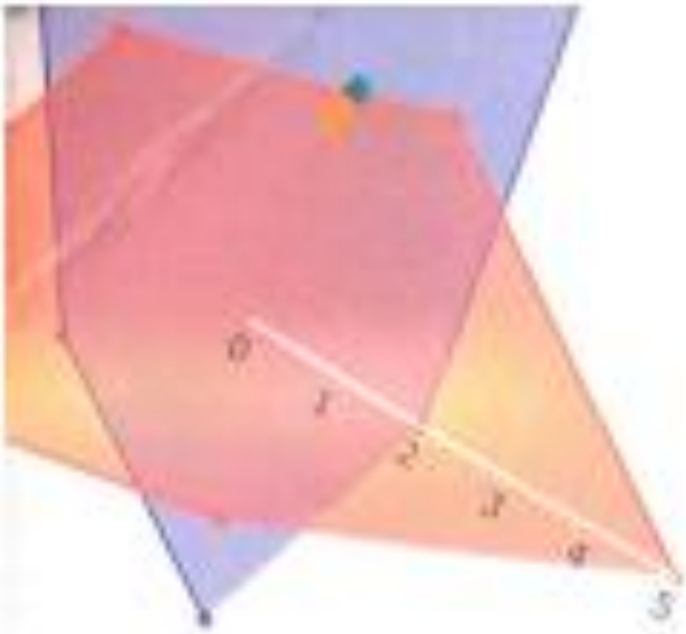

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A- 052

Effect of CuO Nanostructures on Solar Selective Absorbers

S. Devipriya[*1], S. Karthick Kumar[2], N. Murugesan[2], and S. Suresh[3]
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Abstract

Diverse copper oxide (CuO) nanostructured materials (shuttle-like, porous and disk-like) are synthesized for their potential applications in solar thermal devices. The morphological structural and chemical features of the prepared CuO nanostructures are characterized by using Scanning Electron Microscope (SEM), Energy Dispersive X-ray Spectroscope (EDS), UV-vis Spectrophotometer, X-ray Diffraction (XRD) and Fourier transform infra-red spectroscopic (FTIR) techniques. The SEM analyses reveal the formation of shuttle-like, porous and disk-like CuO nanostructures with diameter ranging from 300 nm to 400 nm, 13 μm to 28 μm and 500 nm to 700 nm respectively. XRD patterns of CuO nanostructures indicate that all the diffraction peaks are due to the monoclinic phase of CuO. The EDS indicates the formation of pristine CuO. The FTIR spectra of the CuO nanostructures also confirm the existence of pure CuO. There is an obvious difference in the UV-vis absorbance and reflectance spectra of the CuO nanostructures and that could be attributed to the morphology and structure dependence properties of the respective CuO nanostructures. The outcome of the present study reveals that the CuO nanostructure can be employed as a promising surface material in solar thermal devices.

Keywords: CuO nanostructures; Morphological and structural features; Solar thermal devices; Selective surface.

A- 053

Facile Preparation And Characterization Of MoS_2 Modified CuO Nanocomposite Thin Films For Solar Selective Absorbers

V. Prasanna Venkatesh[*1], S. Karthick Kumar[1], N. Murugesan[1], and S. Suresh[2]

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Abstract

The molybdenum disulfide modified copper oxide (MoS_2/CuO) nanocomposite thin films was grown via dip coating technique on the aluminium (Al) substrate through sol-gel method. The scanning electron microscopy (SEM) was used to obtain the surface morphology of the prepared CuO and MoS_2/CuO thin films. The Crystalline structure was analyzed as monoclinic structure, acquired by the X-ray diffraction (XRD) data. The energy dispersive spectroscopy (EDAX) studies were used to analyze the present chemical content in the prepared samples, which assisted to confirm the purity of the samples. The influence of CuO on the optical properties of the MoS_2/CuO nanocomposite thin films were analysed by the Uv-vis NIR spectrum, which showed the reduction in optical reflectance, and an enhancement in its solar selectivity due to incorporation of CuO with MoS_2. The improvement of efficiency in the prepared nanocomposite sample MoS_2/CuO was attributed to enhancing the absorption of visible region and increasing its solar selectivity. The obtained selectivity value of CuO (16.70) and MoS_2/CuO (19.09) recommend that these materials can be used as the solar absorber in solar collectors.

Keywords: MoS_2/CuO nanocomposite, thin films, dip coating and solar selective absorbers

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